

# SEQUENCE LISTING

<110> REGENERON PHARMACEUTICALS INC.

<120> RECEPTOR BASED ANTAGONISTS, AND METHODS OF MAKING AND USING

<131> REG 110-B-US

<140> 19 787,835

<141> 1999-09-22 International Filing Date

<150> PCT US99 00045

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<150> 09 313,942

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<150> 60 101,858

<151> 1996-09-25

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 Pro Glu Ser Pro Val Val Gln Leu His Ser Asn Phe Thr Ala Val Cys  
 35 40 45  
 Val Leu Lys Glu Lys Cys Met Asp Tyr Phe His Val Asn Ala Asn Tyr  
 50 55 60  
 Ile Val Trp Lys Thr Asn His Phe Thr Ile Pro Lys Glu Gln Tyr Thr  
 65 70 75 80  
 Ile Ile Asn Arg Thr Ala Ser Ser Val Thr Phe Thr Asp Ile Ala Ser  
 85 90 95  
 Leu Asn Ile Gln Leu Thr Cys Asn Ile Leu Thr Phe Gly Gln Leu Glu  
 100 105 110  
 Gln Asn Val Tyr Gly Ile Thr Ile Ile Ser Gly Leu Pro Phe Glu Lys  
 115 120 125  
 Pro Lys Asn Leu Ser Cys Ile Val Asn Gln Gly Lys Lys Met Arg Cys  
 130 135 140

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148					150					155					161
Lys	Ser	Glu	Trp	Ala	Thr	His	Lys	Phe	Ala	Asp	Phe	Lys	Ala	Lys	Arg
			163						171						178
Asp	Thr	Pro	Thr	Ser	Cys	Thr	Val	Asp	Tyr	Ser	Thr	Val	Thr	Pro	Val
			181					183					190		
Asn	Ile	Glu	Val	Trp	Val	Glu	Ala	Glu	Asp	Ala	Leu	Glu	Lys	Val	Thr
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Ser	Asp	His	Ile	Asn	Phe	Asp	Pro	Val	Tyr	Lys	Val	Lys	Pro	Asn	Pro
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225					230					235					240
Lys	Leu	Thr	Trp	Thr	Asn	Pro	Ser	Ile	Lys	Ser	Val	Ile	Ile	Leu	Lys
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Tyr	Asn	Ile	Glu	Tyr	Arg	Thr	Lys	Asp	Ala	Ser	Thr	Trp	Ser	Glu	Ile
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Leu	Lys	Pro	Phe	Thr	Glu	Tyr	Val	Phe	Arg	Ile	Arg	Cys	Met	Lys	Glu
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Thr	Tyr	Glu	Asp	Arg	Pro	Ser	Lys	Ala	Pro	Ser	Phe	Trp	Tyr	Lys	Ile
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Thr	Val	Arg	Asn	Leu	Val	Gly	Lys	Ser	Asp	Ala	Ala	Val	Leu	Thr	Ile
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Pro	Ala	Cys	Asp	Phe	Glu	Ala	Thr	His	Pro	Val	Met	Asp	Leu	Lys	Ala
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Tyr	Leu	Arg	Gly	Asn	Leu	Ala	Glu	Ser	Lys	Cys	Tyr	Leu	Ile	Thr	Val
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Lys	Val	Gly	Lys	Asn	Glu	Ala	Val	Leu	Glu	Trp	Asp	Glu	Leu	Pro	Val
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Ile	Ile	Gly	Asn	Glu	Thr	Ala	Val	Asn	Val	Asp	Ser	Ser	His	Thr	Glu
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Thr	Thr	Pro	Lys	Phe	Ala	Glu	Gly	Glu	Ile	Glu	Ser	Gly	Glu	Pro	Lys
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	630				635					640					645	
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655	Pro	Pro	Val	Leu	Asp	Ser	Asp	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Lys	Leu
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665	Val	Met	His	Glu	Ala	Leu	His	Asn	His	Tyr	Thr	Glu	Lys	Ser	Leu	Ser
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Gly	Val	Glu	Pro	Glu	Asp	Asn	Ala	Thr	Val	His	Trp	Val	Leu	Arg	Lys	
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65					70				75						80	
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Phe	Glu	Glu	Pro	Cys	Glu	Tyr	Ser	Glu	Glu	Ser	Glu	Lys	Phe	Ser	Cys	
			165					170						175		
Glu	Leu	Ala	Val	Pro	Glu	Gly	Asp	Ser	Ser	Phe	Tyr	Ile	Val	Ser	Met	
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Cys	Val	Ala	Ser	Ser	Val	Gly	Ser	Lys	Phe	Ser	Lys	Thr	Glu	Thr	Phe	



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Ile	Val	Trp	Lys	Thr	Asn	His	Phe	Thr	Ile	Pro	Lys	Gln	Gln	Tyr	Thr	
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Ile	Ile	Asn	Arg	Thr	Ala	Ser	Ser	Val	Thr	Phe	Thr	Asp	Ile	Ala	Ser	
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Leu	Asn	Ile	Gln	Leu	Thr	Cys	Asn	Ile	Leu	Thr	Phe	Gly	Gln	Leu	Gln	
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Gln	Asn	Val	Tyr	Gly	Ile	Thr	Ile	Ile	Ser	Gly	Leu	Pro	Pro	Gln	Lys	
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Pro	Lys	Asn	Leu	Ser	Cys	Ile	Val	Asn	Gln	Gly	Lys	Lys	Met	Arg	Cys	
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Gln	Trp	Asp	Gly	Gly	Arg	Gln	Thr	His	Leu	Gln	Thr	Asn	Phe	Thr	Leu	
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Lys	Ser	Gln	Trp	Ala	Thr	His	Lys	Phe	Ala	Asp	Cys	Lys	Ala	Lys	Arg	
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Asp	Thr	Pro	Thr	Ser	Cys	Thr	Val	Asp	Tyr	Ser	Thr	Val	Tyr	Phe	Val	
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Asn	Ile	Gln	Val	Trp	Val	Gln	Ala	Gln	Asn	Ala	Leu	Gly	Lys	Val	Thr	
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Pro	His	Asn	Leu	Ser	Val	Ile	Asn	Ser	Gln	Gln	Leu	Ser	Ser	Ile	Leu	
225					231				235						241	
Lys	Leu	Thr	Trp	Thr	Asn	Pro	Ser	Ile	Lys	Ser	Val	Ile	Ile	Leu	Lys	
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Thr	Val	Arg	Asn	Leu	Val	Gly	Lys	Ser	Asp	Ala	Ala	Val	Leu	Thr	Ile	
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Lys	Val	Gly	Lys	Asn	Glu	Ala	Val	Leu	Glu	Tyr	Asp	Gln	Leu	Pro	Val	
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Asn	Val	Gln	Asn	Gly	Phe	Ile	Arg	Asn	Tyr	Tyr	Ile	Phe	Tyr	Arg	Thr	
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Ile	Ile	Gly	Asn	Glu	Thr	Ala	Val	Asn	Val	Asp	Ser	Ser	His	Thr	Glu	
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Tyr	Thr	Leu	Ser	Ser	Leu	Thr	Ser	Asp	Thr	Leu	Tyr	Met	Val	Arg	Met	
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Ala	Ala	Tyr	Thr	Asp	Glu	Gly	Gly	Lys	Asp	Gly	Pro	Glu	Phe	Thr	Phe	
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Lys	Gly	Pro	Ser	Val	Phe	Pro	Leu	Ala	Pro	Ser	Ser	Lys	Ser	Thr	Ser	
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Asn	Val	Asn	His	Lys	Pro	Ser	Asn	Thr	Lys	Val	Asp	Lys	Lys	Val	Glu	
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Glu	Leu	Leu	Gly	Gly	Pro	Ser	Val	Phe	Leu	Phe	Pro	Pro	Lys	Pro	Lys	
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Gly	Val	Glu	Val	His	Asn	Ala	Lys	Thr	Lys	Pro	Arg	Glu	Glu	Gln	Tyr	
785					790					795					800	
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				805						810				815		
Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys	Lys	Val	Ser	Asn	Lys	Ala	Leu	
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Ile	Ala	Val	Glu	Trp	Glu	Ser	Asn	Gly	Gln	Pro	Glu	Asn	Asn	Tyr	Lys	
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Thr	Thr	Pro	Pro	Val	Leu	Asp	Ser	Asp	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	
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Lys	Leu	Thr	Val	Asp	Lys	Ser	Arg	Trp	Gln	Gln	Gly	Asn	Val	Phe	Ser	
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Cys	Ser	Val	Met	His	Gln	Ala	Leu	His	Asn	His	Tyr	Thr	Gln	Lys	Ser	
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Leu	Ser	Leu	Ser	Pro	Gly	Lys										
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<210> 10

<211> 331

<212> PRT

<213> Homo sapiens

<214> 10

Met	Val	Thr	Leu	Gln	Thr	Trp	Val	Val	Gln	Ala	Leu	Phe	Ile	Phe	Leu
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Val	Leu	Lys	Glu	Lys	Cys	Met	Asp	Tyr	Phe	His	Val	Asn	Ala	Asn	Thr
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Ile	Val	Trp	Lys	Thr	Asn	His	Phe	Thr	Ile	Pro	Lys	Glu	Gln	Tyr	Thr
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Ile	Ile	Asn	Arg	Thr	Ala	Ser	Ser	Val	Thr	Phe	Thr	Asp	Ile	Ala	Ser
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Leu	Asn	Ile	Gln	Leu	Thr	Cys	Asn	Ile	Leu	Thr	Phe	Gly	Gln	Leu	Glu
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Pro	Lys	Asn	Leu	Ser	Cys	Ile	Val	Asn	Gln	Gly	Lys	Lys	Met	Arg	Cys
	130				135						140				
Glu	Trp	Asp	Gly	Gly	Arg	Glu	Thr	His	Leu	Glu	Thr	Asn	Phe	Thr	Leu
145					150					155					160
Lys	Ser	Glu	Trp	Ala	Thr	His	Lys	Phe	Ala	Asp	Cys	Lys	Ala	Lys	Arg
		165						170						175	
Asp	Thr	Pro	Thr	Ser	Cys	Thr	Val	Asp	Tyr	Ser	Thr	Val	Tyr	Phe	Val
	180							185					190		
Asn	Ile	Glu	Val	Trp	Val	Glu	Ala	Glu	Asn	Ala	Leu	Gly	Lys	Val	Thr
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Ser	Asp	His	Ile	Asn	Phe	Asp	Pro	Val	Tyr	Lys	Val	Lys	Pro	Asn	Pro
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225					230					235					240
Lys	Leu	Thr	Trp	Thr	Asn	Pro	Ser	Ile	Lys	Ser	Val	Ile	Ile	Leu	Lys
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Tyr	Asn	Ile	Gln	Tyr	Arg	Thr	Lys	Asp	Ala	Ser	Thr	Trp	Ser	Gln	Ile
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Pro	Pro	Glu	Asp	Thr	Ala	Ser	Thr	Arg	Ser	Ser	Phe	Thr	Val	Gln	Asp
	275					280						285			
Leu	Lys	Pro	Phe	Thr	Glu	Tyr	Val	Phe	Arg	Ile	Arg	Cys	Met	Lys	Glu
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Asp	Gly	Lys	Gly	Tyr	Trp	Ser	Asp	Trp	Ser	Glu	Glu	Ala	Ser	Gly	Ile
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<211> 120

<212> PRT

<213> Homo sapiens

<400> 11

Ser	Gly	Gly	Gln	Gly	Thr	Leu	Val	Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys
1			5						10					15	
Gly	Pro	Ser	Val	Phe	Pro	Leu	Ala	Pro	Ser	Ser	Lys	Ser	Thr	Ser	Gly
	20						25					30			
Gly	Thr	Ala	Ala	Leu	Gly	Cys	Leu	Val	Lys	Asp	Tyr	Phe	Pro	Glu	Pro
	35					40					45				
Val	Thr	Val	Ser	Trp	Asn	Ser	Gly	Ala	Leu	Thr	Ser	Gly	Val	His	Thr
	50					55					60				
Phe	Pro	Ala	Val	Leu	Gln	Ser	Ser	Gly	Leu	Tyr	Ser	Leu	Ser	Ser	Val
65					70				75						80
Val	Thr	Val	Pro	Ser	Ser	Ser	Leu	Gly	Thr	Gln	Thr	Tyr	Ile	Cys	Asn
			85						90					95	



Val	Asn	His	Lys	Pro	Ser	Asn	Thr	Lys	Val	Asp	Lys	Lys	Val	Gln	Pro
			111					108					111		
Lys	Ser	Cys	Asp	Lys	Thr	His	Thr								
		115					111								

<210> 12  
 <211> 328  
 <212> PRT  
 <213> Homo sapiens

Ser	Gly	Ala	Ser	Thr	Lys	Gly	Pro	Ser	Val	Phe	Pro	Leu	Ala	Pro	Cys
1			5						10					15	
Ser	Arg	Ser	Thr	Ser	Glu	Ser	Thr	Ala	Ala	Leu	Gly	Cys	Leu	Val	Lys
		20						25					30		
Asp	Tyr	Phe	Pro	Glu	Pro	Val	Thr	Val	Ser	Trp	Asn	Ser	Gly	Ala	Leu
		35					40					45			
Thr	Ser	Gly	Val	His	Thr	Phe	Pro	Ala	Val	Leu	Gln	Ser	Ser	Gly	Leu
	50					55					60				
Tyr	Ser	Leu	Ser	Ser	Val	Val	Thr	Val	Pro	Ser	Ser	Ser	Leu	Gly	Thr
	65				70					75				80	
Lys	Thr	Tyr	Thr	Cys	Asn	Val	Asp	His	Lys	Pro	Ser	Asn	Thr	Lys	Val
			85						90					95	
Asp	Lys	Arg	Val	Glu	Ser	Lys	Tyr	Gly	Pro	Pro	Cys	Pro	Ser	Cys	Pro
		100						105					110		
Ala	Pro	Glu	Phe	Leu	Gly	Gly	Pro	Ser	Val	Phe	Leu	Phe	Pro	Pro	Lys
		115					120					125			
Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg	Thr	Pro	Glu	Val	Thr	Cys	Val
		130				135					140				
Val	Val	Asp	Val	Ser	Gln	Glu	Asp	Pro	Glu	Val	Gln	Phe	Asn	Trp	Tyr
					150					155				160	
Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala	Lys	Thr	Lys	Pro	Arg	Glu	Glu
			165						170					175	
Gln	Phe	Asn	Ser	Thr	Tyr	Arg	Val	Val	Ser	Val	Leu	Thr	Val	Leu	His
			180					185					190		
Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys	Lys	Val	Ser	Asn	Lys
		195					200					205			
Gly	Leu	Pro	Ser	Ser	Ile	Glu	Lys	Thr	Ile	Ser	Lys	Ala	Lys	Gly	Gln
	210					215					220				
Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr	Leu	Pro	Pro	Ser	Gln	Glu	Glu	Met
				230						235					240
Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys	Leu	Val	Lys	Gly	Phe	Tyr	Pro
			245						250					255	
Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser	Asn	Gly	Gln	Pro	Glu	Asn	Asn
			260					265					270		
Tyr	Lys	Thr	Thr	Pro	Pro	Val	Leu	Asp	Ser	Asp	Gly	Ser	Phe	Phe	Leu
		275						280				285			
Tyr	Ser	Arg	Leu	Thr	Val	Asp	Lys	Ser	Arg	Trp	Gln	Glu	Gly	Asn	Val
	290					295					300				
Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala	Leu	His	Asn	His	Tyr	Thr	Gln
	305				310					315					320
Lys	Ser	Leu	Ser	Leu	Ser	Leu	Gly	Lys							
				325											

<210> 13  
 <211> 138  
 <212> PRT  
 <213> Homo sapiens

Ser	Gly	Thr	Val	Ala	Ala	Pro	Ser	Val	Phe	Ile	Phe	Pro	Pro	Ser	Asp
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

1				5					10					15		
Gln	Gln	Leu	Lys	Ser	Gly	Thr	Ala	Ser	Val	Val	Cys	Leu	Leu	Asn	Asn	
				10				20						30		
Phe	Tyr	Pro	Arg	Glu	Ala	Lys	Val	Gln	Trp	Lys	Val	Asp	Asn	Ala	Leu	
		35					40					45				
Gln	Ser	Gly	Ser	Ser	Gln	Glu	Ser	Val	Thr	Gln	Gln	Asp	Ser	Lys	Asp	
	50					55					60					
Ser	Thr	Tyr	Ser	Leu	Ser	Ser	Thr	Leu	Thr	Leu	Ser	Lys	Ala	Asp	Tyr	
65						70				75					80	
Glu	Lys	His	Lys	Val	Tyr	Ala	Cys	Gln	Val	Thr	His	Gln	Gly	Leu	Ser	
			85						90					95		
Ser	Pro	Val	Thr	Lys	Ser	Phe	Asn	Arg	Gly	Gln	Cys					
			100					105								

<210> 14  
 <211> 106  
 <212> PRT  
 <213> Homo sapiens

Ser	Gly	Pro	Lys	Ala	Ala	Pro	Ser	Val	Thr	Leu	Phe	Pro	Pro	Ser	Ser	
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Glu	Glu	Leu	Gln	Ala	Asn	Lys	Ala	Thr	Leu	Val	Cys	Leu	Ile	Ser	Asp	
		20						25					30			
Phe	Tyr	Pro	Gly	Ala	Val	Thr	Val	Ala	Trp	Lys	Ala	Asp	Ser	Ser	Pro	
		35					40					45				
Val	Lys	Ala	Gly	Val	Glu	Thr	Thr	Thr	Pro	Ser	Lys	Gln	Ser	Asn	Asn	
	50					55					60					
Lys	Tyr	Ala	Ala	Ser	Ser	Tyr	Leu	Ser	Leu	Thr	Pro	Glu	Gln	Trp	Lys	
65					70					75					80	
Ser	His	Arg	Ser	Tyr	Ser	Cys	Gln	Val	Thr	His	Glu	Gly	Ser	Thr	Val	
			85						90					95		
Glu	Lys	Thr	Val	Ala	Pro	Thr	Glu	Cys	Ser							
			100					105								

<210> 15  
 <211> 360  
 <212> PRT  
 <213> Homo sapiens

Met	Val	Ala	Val	Gly	Cys	Ala	Leu	Leu	Ala	Ala	Leu	Leu	Ala	Ala	Pro	
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Gly	Ala	Ala	Leu	Ala	Pro	Arg	Arg	Cys	Pro	Ala	Gln	Glu	Val	Ala	Arg	
		20						25					30			
Gly	Val	Leu	Thr	Ser	Leu	Pro	Gly	Asp	Ser	Val	Thr	Leu	Thr	Cys	Pro	
		35					40					45				
Gly	Val	Glu	Pro	Glu	Asp	Asn	Ala	Thr	Val	His	Trp	Val	Leu	Arg	Lys	
	50					55					60					
Pro	Ala	Ala	Gly	Ser	His	Pro	Ser	Arg	Trp	Ala	Gly	Met	Gly	Arg	Arg	
65					70					75					80	
Leu	Leu	Leu	Arg	Ser	Val	Gln	Leu	His	Asp	Ser	Gly	Asn	Tyr	Ser	Cys	
			85						90					95		
Tyr	Arg	Ala	Gly	Arg	Pro	Ala	Gly	Thr	Val	His	Leu	Leu	Val	Asp	Val	
		100						105					110			
Pro	Pro	Glu	Pro	Pro	Gln	Leu	Ser	Cys	Phe	Arg	Lys	Ser	Pro	Leu	Ser	
		115					120					125				
Asn	Val	Val	Cys	Glu	Trp	Gly	Pro	Arg	Ser	Thr	Pro	Ser	Leu	Thr	Thr	
	130					135					140					
Lys	Ala	Val	Leu	Leu	Val	Arg	Lys	Phe	Gln	Asn	Ser	Pro	Ala	Gln	Asp	
145					150				155					160		

Phe	Gln	Glu	Pro	Cys	Gln	Tyr	Ser	Gln	Glu	Ser	Gln	Lys	Phe	Ser	Cys	
				165					170							
Gln	Leu	Ala	Val	Pro	Gln	Gly	Asp	Ser	Ser	Phe	Tyr	Ile	Val	Ser	Met	
			180					185					190			
Cys	Val	Ala	Ser	Ser	Val	Gly	Ser	Lys	Phe	Ser	Lys	Thr	Gln	Thr	Phe	
		195					200					205				
Gln	Gly	Cys	Gly	Ile	Leu	Gln	Pro	Asp	Pro	Pro	Ala	Asn	Ile	Thr	Val	
	210					215					220					
Thr	Ala	Val	Ala	Arg	Asn	Pro	Arg	Trp	Leu	Ser	Val	Thr	Trp	Gln	Asp	
225					230					235					240	
Pro	His	Ser	Trp	Asn	Ser	Ser	Phe	Tyr	Arg	Leu	Arg	Phe	Glu	Leu	Arg	
				245					250					255		
Tyr	Arg	Ala	Glu	Arg	Ser	Lys	Thr	Phe	Thr	Thr	Trp	Met	Val	Lys	Asp	
		260						265					270			
Leu	Gln	His	His	Cys	Val	Ile	His	Asp	Ala	Trp	Ser	Gly	Leu	Arg	His	
	275						280					285				
Val	Val	Gln	Leu	Arg	Ala	Gln	Glu	Glu	Phe	Gly	Gln	Gly	Glu	Trp	Ser	
	290					295					300					
Glu	Trp	Ser	Pro	Glu	Ala	Met	Gly	Thr	Pro	Trp	Thr	Glu	Ser	Arg	Ser	
305					310					315					320	
Pro	Pro	Ala	Glu	Asn	Glu	Val	Ser	Thr	Pro	Met	Gln	Ala	Leu	Thr	Thr	
				325					330					335		
Asn	Lys	Asp	Asp	Asp	Asn	Ile	Leu	Phe	Arg	Asp	Ser	Ala	Asn	Ala	Thr	
		340						345					350			
Ser	Leu	Pro	Val	Gln	Asp	Ala	Gly									
		355					360									

<210> 16  
 <211> 315  
 <212> PRT  
 <213> Homo sapiens

<400> 16

Met	Val	Ala	Val	Gly	Cys	Ala	Leu	Leu	Ala	Ala	Leu	Leu	Ala	Ala	Pro	
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Gly	Ala	Ala	Leu	Ala	Pro	Arg	Arg	Cys	Pro	Ala	Gln	Glu	Val	Ala	Arg	
			20					25					30			
Gly	Val	Leu	Thr	Ser	Leu	Pro	Gly	Asp	Ser	Val	Thr	Leu	Thr	Cys	Pro	
		35					40					45				
Gly	Val	Glu	Pro	Glu	Asp	Asn	Ala	Thr	Val	His	Trp	Val	Leu	Arg	Lys	
	50				55					60						
Pro	Ala	Ala	Gly	Ser	His	Pro	Ser	Arg	Trp	Ala	Gly	Met	Gly	Arg	Arg	
65					70				75					80		
Leu	Leu	Leu	Arg	Ser	Val	Gln	Leu	His	Asp	Ser	Gly	Asn	Tyr	Ser	Cys	
			85					90				95				
Tyr	Arg	Ala	Gly	Arg	Pro	Ala	Gly	Thr	Val	His	Leu	Leu	Val	Asp	Val	
		100					105					110				
Pro	Pro	Glu	Glu	Pro	Gln	Leu	Ser	Cys	Phe	Arg	Lys	Ser	Pro	Leu	Ser	
		115					120					125				
Asn	Val	Val	Cys	Glu	Trp	Gly	Pro	Arg	Ser	Thr	Pro	Ser	Leu	Thr	Thr	
	130					135					140					
Lys	Ala	Val	Leu	Leu	Val	Arg	Lys	Phe	Gln	Asn	Ser	Pro	Ala	Glu	Asp	
145					150				155					160		
Phe	Gln	Glu	Pro	Cys	Gln	Tyr	Ser	Gln	Glu	Ser	Gln	Lys	Phe	Ser	Cys	
			165					170					175			
Gln	Leu	Ala	Val	Pro	Gln	Gly	Asp	Ser	Ser	Phe	Tyr	Ile	Val	Ser	Met	
		180						185					190			
Cys	Val	Ala	Ser	Ser	Val	Gly	Ser	Lys	Phe	Ser	Lys	Thr	Gln	Thr	Phe	
	195						200					205				
Gln	Gly	Cys	Gly	Ile	Leu	Gln	Pro	Asp	Pro	Pro	Ala	Asn	Ile	Thr	Val	
	210					215					220					

Thr Ala Val Ala Arg Ser Pro Arg Trp Leu Ser Val Thr Trp Gln Asp  
 208 230 240 250 260 270 280 290 300 310  
 Pro His Ser Trp Asn Ser Ser Phe Tyr Arg Leu Arg Phe Gln Leu Arg  
 Tyr Arg Ala Gln Arg Ser Lys Thr Phe Thr Thr Trp Met Val Lys Arg  
 260 270 280 290 300 310  
 Leu Gln His His Cys Val Ile His Asp Ala Trp Ser Gln Leu Arg His  
 270 280 290 300 310  
 Val Val Gln Leu Arg Ala Gln Gln Gln Phe Gly Gln Gly Gln Trp Ser  
 290 300 310  
 Gln Trp Ser Pro Gln Ala Met Gly Thr Thr Gly  
 305 310 315

<210> 17  
 <211> 2085  
 <212> DNA  
 <213> Homo sapiens

<220>  
 <221> CDS  
 <222> (1)...(2082)

<400> 17  
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 Met Val Lys Pro Ser Leu Pro Phe Thr Ser Leu Leu Phe Leu Gln Leu  
 1 5 10 15  
 ccc ctg ctg gga gtg ggg ctg aac acg aca att ctg acg ccc aat ggg 96  
 Pro Leu Leu Gly Val Gly Leu Asn Thr Thr Ile Leu Thr Pro Asn Gly  
 20 25 30  
 aat gaa gat aat aca gct gat ttc ttc ctg aac act atg ccc act gac 144  
 Asn Glu Asp Thr Thr Ala Asp Phe Phe Leu Thr Thr Met Pro Thr Asp  
 35 40 45  
 tcc ctc agt ggt tcc act ctg ccc ctc cca gag gtt cag tgt ttt gtg 192  
 Ser Leu Ser Val Ser Thr Leu Pro Leu Pro Gln Val Gln Cys Phe Val  
 50 55 60  
 ttc aat gtc gag tac atg aat tgc act tgg aac agc agt tct gag ccc 240  
 Phe Asn Val Gln Tyr Met Asn Cys Thr Trp Asn Ser Ser Ser Glu Pro  
 65 70 75 80  
 cag ctt acc aac ctc act ctg cat tat tgg tac aag aac tgg gat aat 288  
 Gln Pro Thr Asn Leu Thr Leu His Tyr Trp Tyr Lys Asn Ser Asp Asn  
 85 90 95  
 gat aaa gtc cag aag tgc agc cac tat cta ttc tct gaa gaa atc act 336  
 Asp Lys Val Gln Lys Cys Ser His Tyr Leu Phe Ser Gln Gln Ile Thr  
 100 105 110  
 tct ggc tgt cag ttg caa aaa aag gag atc cac ctc tac caa aca ctt 384  
 Ser Gly Cys Gln Leu Gln Lys Lys Gln Ile His Leu Tyr Gln Thr Phe  
 115 120 125  
 gtt gtt cag ctg cag gac caa cgg gaa ccc agg aca cag gcc aca cag 432  
 Val Val Gln Leu Gln Asp Pro Arg Gln Pro Arg Arg Gln Ala Thr Gln  
 130 135 140  
 atg cta aaa ctg cag aat ctg gtc atc ccc tgg gct cca gag aac cta 480  
 Met Leu Lys Leu Gln Asn Leu Val Ile Pro Trp Ala Pro Gln Asn Leu  
 145 150 155

145																150																155																160
aca	tct	cgc	aaa	ctg	agc	gaa	tcc	cag	cca	gaa	ctg	aac	ctg	aac	aac		516																															
Thr	Leu	His	Lys	Leu	Ser	Glu	Ser	Glu	Leu	Glu	Leu	Met	Lys	Met	Met																																	
																	165																170															
aga	ttc	ttg	aac	cgc	tct	ctg	gac	ctc	gtc	cag	tac	cgc	aat	gac	gac		576																															
Arg	Phe	Leu	Asn	His	Cys	Leu	Glu	His	Val	Glu	Lys	Arg	Thr	Arg	Thr																																	
																	175																180															
tgg	gac	cgc	agc	tgg	aat	gaa	gaa	tca	gtc	gat	cat	aga	cat	aag	ttc		624																															
Trp	Asp	His	Ser	Trp	Thr	Glu	Glu	Ser	Val	Asp	Tyr	Arg	His	Lys	Phe																																	
																	195																200															
tcc	ttg	cct	agt	gtc	gat	ggg	gag	aaa	ggc	tac	aag	ctt	agt	gct	gag		672																															
Ser	Leu	Pro	Ser	Val	Asp	Gly	Glu	Lys	Arg	Tyr	Thr	Phe	Arg	Val	Arg																																	
																	210																215															
agc	cgc	ttt	aac	cca	ctc	tgc	gga	agt	gct	cag	cat	tgg	agt	gaa	tgg		720																															
Ser	Arg	Phe	Asn	Pro	Leu	Cys	Gly	Ser	Ala	Glu	His	Trp	Ser	Glu	Trp																																	
																	225																230															
agc	cgc	cca	atc	cgc	tgg	ggg	agc	aac	att	tca	aaa	gag	aac	gag	tgg		768																															
Ser	His	Pro	Ile	His	Trp	Gly	Ser	Asn	Thr	Ser	Lys	Glu	Asn	Ala	Ser																																	
																	245																250															
tcc	ggg	aac	atg	aag	gtc	ctg	gag	gag	ccc	acc	tgc	gtc	tcc	gac	taa		816																															
Ser	Gly	Asn	Met	Lys	Val	Leu	Glu	Glu	Pro	Thr	Cys	Val	Ser	Asp	Tyr																																	
																	260																265															
atg	agc	atc	tct	act	tgc	gag	tgg	aag	atg	aac	ggt	ccc	acc	aac	tgc		864																															
Met	Ser	Ile	Ser	Thr	Cys	Glu	Trp	Lys	Met	Asn	Gly	Pro	Thr	Asn	Cys																																	
																	275																280															
agc	acc	gag	ctc	cgc	ctg	ttg	taa	cag	ctg	gct	ttt	ctg	ctc	tcc	gaa		912																															
Ser	Thr	Glu	Leu	Arg	Leu	Leu	Tyr	Glu	Leu	Val	Phe	Leu	Leu	Ser	Glu																																	
																	290																295															
gac	cgc	acg	tgt	acc	cct	gag	aac	aac	gga	ggc	gcg	ggg	tgc	gtg	tgc		960																															
Ala	His	Thr	Cys	Ile	Pro	Glu	Asn	Asn	Gly	Gly	Ala	Gly	Cys	Val	Cys																																	
																	305																310															
cac	ctg	ctc	atg	gat	gac	gtc	gtc	agt	gcg	gat	aac	tat	aca	ctg	gac		1008																															
His	Leu	Leu	Met	Asp	Asp	Val	Val	Ser	Ala	Asp	Asn	Tyr	Thr	Leu	Asp																																	
																	325																330															
ctg	tgg	gct	ggg	cag	cag	ctg	ctg	tgg	aag	ggc	tcc	tcc	aag	ccc	agc		1056																															
Leu	Trp	Ala	Gly	Glu	Glu	Leu	Leu	Trp	Lys	Gly	Ser	Phe	Lys	Pro	Ser																																	
																	340																345															
gag	cat	gtc	aaa	ccc	agg	gcc	cca	gga	aac	ctg	aca	gtt	cac	acc	aat		1104																															
Glu	His	Val	Lys	Pro	Arg	Ala	Pro	Gly	Asn	Leu	Thr	Glu	His	Thr	Asn																																	
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gtc	tcc	gac	aat	ctg	ctg	ctg	acc	tgg	agc	aac	ccg	cat	ccc	ccc	gac		1152																															
Val	Ser	Asp	Thr	Leu	Leu	Leu	Thr	Trp	Ser	Asn	Pro	Tyr	Pro	Pro	Asp																																	
																	370																375															
aat	tac	ctg	tat	aat	cat	ctc	aaa	tat	gca	ctc	aac	aat	tgg	agt	gaa		1200																															
Asn	Tyr	Leu	Tyr	Asn	His	Leu	Ser	Tyr	Ala	Val	Asn	Ile	Trp	Ser	Glu																																	
																	385																390															

aaa gaa ccc gaa gat ttc aga atc tat aac gtg acc tac tca gaa ccc	1248
Asn Asn Pro Ala Asp Thr Arg Ile Tyr Asn Val Thr Tyr Leu Glu Pro	
405 410 415	
ccc ctc cgc atc gaa gcc agc acc ctg aag tcc ggg acc tcc tac agg	1296
Ser Leu Arg Ile Ala Ala Ser Thr Leu Lys Ser Gly Ile Ser Tyr Arg	
420 425 430	
gca cgg ctg agc ggc tgg gct cag tgc tat aac acc acc tgg agt gag	1344
Ala Arg Val Arg Ala Thr Ala Glu Cys Tyr Asn Thr Thr Tyr Ser Glu	
435 440 445	
tgg agc ccc agc acc aag tgg cac aac tcc tac agc gag ccc ttc gag	1392
Tyr Ser Pro Ser Thr Lys Trp His Asn Ser Tyr Arg Glu Pro Phe Glu	
450 455 460	
cag tcc gga gac aaa acc cac aca tgc cca ccg tgc cca gca ccc gaa	1440
Glu Ser Gly Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu	
465 470 475 480	
ctc ctg ggg gga cgg tca gtc ttc ctg ttc ccc cca aaa ccc aag gac	1488
Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp	
485 490 495	
acc ctc atg atc tcc cgg acc cct gag gtc aca tgc gtg gtg gtg gac	1536
Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp	
500 505 510	
gtg agc cac gaa gac ccc gag gtc aag ttc aac tgg tac gtg gac ggc	1584
Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly	
515 520 525	
gtg gag gtg tat aat gcc aag aca aag ccg cgg gag gag cag tac aac	1632
Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Glu Tyr Asn	
530 535 540	
agc aag tac cgt gtg gtc agc gtc ctg acc gtc ctg cac cag gac tgg	1680
Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Glu Asp Trp	
545 550 555 560	
ccg aat ggc aag gag tac aag tgc aag gtc tcc aac aaa gcc ccc cca	1728
Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro	
565 570 575	
gcc ccc atc gag aaa acc att tcc aaa gcc aaa ggg cag ccc cga gaa	1776
Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Glu Pro Arg Glu	
580 585 590	
cca cag gtg tac acc ctg ccc cca tcc cgg gag gag atg acc aag aac	1824
Pro Glu Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn	
595 600 605	
cag gtc agc ctg acc tgc ctg gtc aaa ggc ttc tat ccc agc gac atc	1872
Glu Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asy Ile	
610 615 620	
gcc gtg gac tgg gag agc aat ggg cag ccc gag aac aac tac aag acc	1920
Ala Val Glu Tyr Glu Ser Asn Glu Glu Phe Glu Asn Asn Tyr Lys Thr	
625 630 635 640	

aag	ggt	gag	gtg	ctg	gag	taa	gac	ggc	tcg	ttc	ttc	ctc	gat	agg	aag	1963
thr	pro	gag	val	leu	asn	ser	asn	gly	ser	phe	phe	leu	tyr	ser	lys	
				645					661					688		
ctc	acc	gtg	gac	aag	agg	agg	tcg	cag	cag	ggg	aac	gtc	ttc	tca	tgc	2016
leu	thr	val	asn	lys	ser	arg	trp	gln	gln	gly	asn	val	phe	ser	cys	
			660					666					670			
taa	gtg	atg	cat	gag	ggt	ctg	cac	aac	cac	tac	acg	cag	aag	agg	ctc	2064
ser	val	met	his	gln	ala	leu	his	asn	his	tyr	thr	gln	lys	ser	leu	
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Phe	Asn	Val	Glu	Tyr	Met	Asn	Cys	Thr	Trp	Asn	Ser	Ser	Ser	Glu	Pro	
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Gln	Pro	Thr	Asn	Leu	Thr	Leu	His	Tyr	Trp	Tyr	Lys	Asn	Ser	Asp	Asn	
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Asp	Lys	Val	Gln	Lys	Cys	Ser	His	Tyr	Leu	Phe	Ser	Glu	Glu	Ile	Thr	
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Met	Leu	Lys	Leu	Gln	Asn	Leu	Val	Ile	Pro	Trp	Ala	Pro	Glu	Asn	Leu	
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Arg	Phe	Leu	Asn	His	Cys	Leu	Glu	His	Leu	Val	Gln	Tyr	Arg	Thr	Asp	
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Asn	Tyr	Leu	Tyr	Asn	His	Leu	Thr	Tyr	Ala	Val	Asn	Ile	Trp	Ser	Glu
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Asn	Asp	Pro	Ala	Asp	Phe	Arg	Ile	Tyr	Asn	Val	Thr	Tyr	Leu	Glu	Pro
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	595					600						605			
Gln	Val	Ser	Leu	Thr	Cys	Leu	Val	Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile
	610					615					620				
Ala	Val	Glu	Trp	Glu	Ser	Asn	Gly	Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr
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Thr	Pro	Pro	Val	Leu	Asp	Ser	Asp	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Lys
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Thr	Leu	His	Lys	Leu	Ser	Glu	Ser	Gln	Leu	Glu	Leu	Asn	Trp	Asn	Asn	
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Trp	Asp	His	Ser	Trp	Thr	Glu	Gln	Ser	Val	Asp	Tyr	Arg	His	Lys	Phe	
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Lys	Pro	Arg	Ala	Pro	Gly	Asn	Leu	Thr	Val	His	Thr	Asn	Val	Ser	Asp	
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Thr	Leu	Leu	Leu	Thr	Trp	Ser	Asn	Pro	Tyr	Pro	Pro	Asp	Asn	Tyr	Leu	
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Tyr	Asn	His	Leu	Thr	Tyr	Ala	Val	Asn	His	Trp	Ser	Glu	Asn	Asp	Pro	
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Ala	Asp	Phe	Arg	His	Tyr	Asn	Val	Thr	Tyr	Leu	Glu	Pro	Ser	Leu	Arg	
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atc	gca	gac	agg	acc	ctg	aag	ttc	ggg	att	ccc	tac	agg	gca	ggc	gtg	1296
His	Ala	Ala	Ser	Thr	Leu	Lys	Ser	Gly	His	Ser	Tyr	Arg	Ala	Arg	Val	
			420					425					430			
agg	gac	ttg	gac	cag	agg	tat	aac	acc	acc	ttg	agg	gag	ttg	agg	ccc	1344
Arg	Ala	Trp	Ala	Gln	Ser	Tyr	Asn	Thr	Thr	Trp	Ser	Glu	Trp	Ser	Pro	
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Ser	Thr	Lys	Trp	His	Asn	Ser	Tyr	Arg	Glu	Pro	Phe	Glu	Gln	Ser	Gly	
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Asp	Lys	Thr	His	Thr	Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Leu	Leu	Gly	
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	36					41						46			
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Gln	Pro	Thr	Asn	Leu	Thr	Leu	His	Tyr	Trp	Tyr	Lys	Asn	Ser	Asp	Asn
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Thr	Leu	His	Lys	Leu	Ser	Glu	Ser	Gln	Leu	Glu	Leu	Asn	Trp	Asn	Asn
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Arg	Phe	Leu	Asn	His	Cys	Leu	Glu	His	Leu	Val	Gln	Tyr	Arg	Thr	Asp
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Val	Leu	Asp	Ser	Asp	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Lys	Leu	Thr	Val		
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Asn	Glu	Asp	Thr	Thr	Ala	Asp	Phe	Phe	Leu	Thr	Thr	Met	Pro	Thr	Asp		
		35					40					45					
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Ser	Leu	Ser	Val	Ser	Thr	Leu	Pro	Leu	Pro	Gln	Val	Gln	Cys	Phe	Val		
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Pro	Asn	Val	Glu	Tyr	Met	Asn	Cys	Thr	Trp	Asn	Ser	Ser	Ser	Glu	Pro		
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cag	ccc	acc	aac	ctc	act	ctg	cac	tac	tgg	tac	aag	aac	ctg	gat	aac		288
Gln	Pro	Thr	Asn	Leu	Thr	Leu	His	Tyr	Trp	Tyr	Lys	Asn	Ser	Arg	Asn		
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gag	aaa	gtc	cag	aag	tgc	agg	gac	tac	ata	ttc	tcc	gaa	gaa	atc	act	336
Asn	Lys	Val	Gln	Lys	Cys	Ser	His	Tyr	Leu	Phe	Ser	Glu	Glu	Ile	Thr	
		117						118					119			
tcc	ggc	tgt	cag	tgc	caa	aaa	aag	gag	atc	gac	ctc	cac	gaa	aca	ttc	364
Ser	Gly	Cys	Gln	Leu	Gln	Lys	Lys	Glu	Ile	His	Leu	Tyr	Gln	Thr	Phe	
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Val	Val	Gln	Leu	Gln	Arg	Pro	Arg	Glu	Pro	Arg	Arg	Gln	Ile	Thr	Gln	
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atg	cta	aaa	ctg	cag	aat	ctg	gtg	atc	ccc	tgg	gct	cca	gag	aac	cta	480
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Thr	Leu	His	Lys	Leu	Ser	Glu	Ser	Gln	Leu	Glu	Leu	Asn	Trp	Asn	Asn	
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aga	ccc	ctg	aac	cac	tgt	tgg	gag	cac	ctg	gtg	cag	cac	ggg	acc	gac	576
Arg	Phe	Leu	Asn	His	Cys	Leu	Glu	His	Leu	Val	Gln	Tyr	Arg	Thr	Asp	
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tgg	gac	cac	agg	tgg	act	gaa	caa	cca	gtg	gat	tat	aga	cat	aag	ttc	624
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tcc	tgg	ctt	agt	gtg	gat	ggg	cag	aaa	ggc	cac	acg	ttt	ggt	gtt	ggg	672
Ser	Leu	Pro	Ser	Val	Asp	Gly	Gln	Lys	Arg	Tyr	Thr	Phe	Arg	Val	Arg	
		210				215					220					
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Ser	Arg	Phe	Asn	Pro	Leu	Cys	Gly	Ser	Ala	Gln	His	Trp	Ser	Glu	Trp	
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Met	Ser	Ile	Ser	Thr	Cys	Glu	Trp	Lys	Met	Asn	Gly	Pro	Thr	Asn	Cys	
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His	Leu	Leu	Met	Arg	Arg	Val	Val	Ser	Ile	Asp	Asn	Tyr	Thr	Leu	Arg	
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Glu	His	Val	Lys	Pro	Arg	Ala	Pro	Gly	Asn	Leu	Thr	Val	His	Thr	Asn	
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Asn	Tyr	Leu	Tyr	Asn	His	Leu	Thr	Tyr	Ala	Val	Asn	Ile	Trp	Ser	Glu	
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aac	gac	ccg	gca	gat	tcc	aga	atc	tat	aac	gtg	acc	tac	cta	gaa	ccc	1248
Asn	Asp	Pro	Ala	Asp	Phe	Arg	Ile	Tyr	Asn	Val	Thr	Tyr	Leu	Glu	Pro	
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Ala	Arg	Val	Arg	Ala	Trp	Ala	Gln	Ser	Tyr	Asn	Thr	Thr	Trp	Ser	Glu	
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Trp	Ser	Pro	Ser	Thr	Lys	Trp	His	Asn	Ser	Tyr	Arg	Glu	Pro	Phe	Glu	
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Gln	Ser	Gly	Asp	Lys	Thr	His	Thr	Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	
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Thr	Leu	Met	Ile	Ser	Arg	Thr	Pro	Glu	Val	Thr	Cys	Val	Val	Val	Asp	
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Val	Ser	His	Glu	Asp	Pro	Glu	Val	Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly	
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Val	Glu	Val	His	Asn	Ala	Lys	Thr	Lys	Pro	Arg	Glu	Glu	Gln	Tyr	Asn	
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Ser	Thr	Tyr	Arg	Val	Val	Ser	Val	Leu	Thr	Val	Leu	His	Gln	Asp	Trp	
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Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys	Lys	Val	Ser	Asn	Lys	Ala	Leu	Pro	
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Gln	Val	Ser	Leu	Thr	Cys	Leu	Val	Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	
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Thr	Pro	Pro	Val	Leu	Asp	Ser	Asp	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Lys	
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Ser	Leu	Ser	Val	Ser	Thr	Leu	Pro	Leu	Pro	Glu	Val	Gln	Cys	Phe	Val	
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Phe	Asn	Val	Glu	Tyr	Met	Asn	Cys	Thr	Trp	Asn	Ser	Ser	Ser	Glu	Pro	
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Gln	Pro	Thr	Asn	Leu	Thr	Leu	His	Tyr	Trp	Tyr	Lys	Asn	Ser	Asp	Asn	
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Asp	Lys	Val	Gln	Lys	Cys	Ser	His	Tyr	Leu	Phe	Ser	Glu	Glu	Ile	Thr	
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Ser	Gly	Cys	Gln	Leu	Gln	Lys	Lys	Glu	Ile	His	Leu	Tyr	Gln	Thr	Phe	
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Val	Val	Gln	Leu	Gln	Asp	Pro	Arg	Glu	Pro	Arg	Arg	Gln	Ala	Thr	Gln	
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Arg	Phe	Leu	Asn	His	Cys	Leu	Gln	His	Leu	Val	Gln	Tyr	Arg	Thr	Asp	



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Gln	Ser	Gly	Asp	Lys	Thr	His	Thr	Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	
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Asn Val Val Cys Gln Trp Gly Pro Arg Ser Thr Pro Ser Leu Thr Thr  
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Phe Gln Gln Pro Cys Gln Tyr Ser Gln Gln Ser Gln Lys Phe Ser Cys  
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Cys	Val	Ala	Ser	Ser	Val	Gly	Ser	Lys	Phe	Ser	Lys	Thr	Gln	Thr	Phe				
195				200				205											
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Leu	Gln	His	His	Cys	Val	Ile	His	Asp	Ala	Trp	Ser	Gly	Leu	Arg	His				
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Leu	Lys	Glu	Lys	Cys	Met	Asp	Tyr	Phe	His	Val	Asn	Ala	Asn	Tyr	Ile				
				370				375				380							
gtc	tgg	aaa	aca	aac	cat	ttc	act	att	ccc	aag	gag	caa	tat	act	atc	1200			
Val	Trp	Lys	Thr	Asn	His	Phe	Thr	Ile	Pro	Lys	Gln	Gln	Tyr	Thr	Ile				
				385				390				395				400			
ata	aac	aga	aca	gca	ccc	agt	gtc	acc	ccc	aca	gat	ata	gct	cca	cta	1248			
Ile	Asn	Arg	Thr	Ala	Ser	Ser	Val	Thr	Phe	Thr	Arg	Ile	Ala	Ser	Leu				
				405				410				415							
aat	att	cag	ctc	act	tgc	aac	att	ctc	aca	ccc	gga	cag	ctc	gaa	cag	1296			
Asn	Ile	Gln	Leu	Thr	Cys	Asn	Ile	Leu	Thr	Phe	Gly	Gln	Leu	Gln	Gln				
				420				425				430							

aat	ggt	tat	gga	att	aca	att	att	tca	ggc	tgg	ccg	cca	gaa	aaa	ccg	1344
Asn	Val	Tyr	Gly	Ile	Thr	Ile	Ile	Ser	Gly	Leu	Pro	Pro	Glu	Lys	Pro	
	436						440					445				
aaa	aat	tgg	agt	tgc	att	gtg	aac	gag	ggg	aag	aaa	atg	agg	tgt	gag	1392
Lys	Asn	Leu	Ser	Cys	Ile	Val	Asn	Glu	Gly	Lys	Lys	Met	Arg	Cys	Glu	
	450					455					460					
tgg	gat	ggt	gga	agg	gaa	aca	aac	tgg	gag	aca	aac	ttc	act	ttt	aaa	1440
Tyr	Arg	Gly	Gly	Arg	Glu	Thr	His	Leu	Glu	Thr	Asn	Phe	Thr	Ile	Lys	
	465				470				475						480	
ccg	gaa	tgg	gca	aca	aac	aag	ttt	gct	gat	tgc	aaa	gca	aaa	ccg	gac	1488
Ser	Glu	Tyr	Ala	Thr	His	Lys	Phe	Ala	Asp	Cys	Lys	Ala	Lys	Arg	Asp	
			485						490					495		
acc	ccc	acc	tca	tgc	act	gtt	gat	tat	tcg	act	gtg	tac	ttc	gtc	aac	1536
Thr	Pro	Thr	Ser	Cys	Thr	Val	Asp	Tyr	Ser	Thr	Val	Tyr	Phe	Val	Asn	
			500					505					510			
att	gaa	gtc	tgg	gta	gaa	gca	gag	aat	gac	ctt	ggg	aag	gtt	aca	tca	1584
Ile	Glu	Val	Trp	Val	Glu	Ala	Glu	Asn	Ala	Leu	Gly	Lys	Val	Thr	Ser	
	515						520					525				
gat	cat	atc	aat	ttt	gat	ccg	gta	tat	aaa	gtg	aag	ccc	aat	ccg	cca	1632
Asp	His	Ile	Asn	Phe	Asp	Pro	Val	Tyr	Lys	Val	Lys	Pro	Asn	Pro	Pro	
	530					535					540					
cat	aat	ttt	tca	gtg	atc	aac	tca	gag	gaa	ctg	tcg	agt	atc	ttt	aaa	1680
His	Asn	Leu	Ser	Val	Ile	Asn	Ser	Glu	Glu	Leu	Ser	Ser	Ile	Leu	Lys	
	545				550					555					560	
tgg	aca	tgg	acc	aac	cca	agt	att	aag	agt	gtt	ata	ata	cta	aaa	tat	1728
Leu	Thr	Trp	Thr	Asn	Pro	Ser	Ile	Lys	Ser	Val	Ile	Ile	Leu	Lys	Tyr	
				565				570					575			
aac	att	caa	tat	agg	acc	aaa	gat	gac	tca	act	tgg	agg	cag	att	ccg	1776
Asn	Ile	Gln	Tyr	Arg	Thr	Lys	Asp	Ala	Ser	Thr	Trp	Ser	Gln	Ile	Pro	
			580					585					590			
ccg	gaa	gac	aca	gca	ccc	acc	cca	tcg	tca	ttc	act	gtc	caa	gac	ctt	1824
Pro	Glu	Asp	Thr	Ala	Ser	Thr	Arg	Ser	Ser	Phe	Thr	Val	Gln	Asp	Leu	
	595						600					605				
aaa	tcg	ttt	aca	gaa	tat	gtg	ttt	agg	att	ccg	tgt	atg	aag	gaa	gat	1872
Lys	Pro	Phe	Thr	Glu	Tyr	Val	Phe	Arg	Ile	Arg	Cys	Met	Lys	Glu	Asp	
	610					615					620					
ggg	aag	gga	tac	tgg	agt	gac	tgg	agt	gaa	gaa	gca	agt	ggg	att	atc	1920
Gly	Lys	Gly	Tyr	Trp	Ser	Asp	Trp	Ser	Glu	Glu	Ala	Ser	Gly	Ile	Thr	
	625				630				635						640	
tat	gaa	gat	aga	cca	tcg	aaa	gca	cca	agt	ttc	tgg	tat	aaa	ata	gat	1968
Tyr	Glu	Arg	Arg	Pro	Ser	Lys	Ala	Pro	Ser	Phe	Trp	Tyr	Lys	Ile	Asp	
				645				650						655		
cca	ccc	cat	act	caa	ggc	tac	aga	act	gta	caa	ccc	gtg	tgg	aag	aca	2016
Pro	Ser	His	Thr	Gln	Gly	Tyr	Arg	Thr	Val	Gln	Leu	Val	Tyr	Lys	Thr	
			660				665						670			

ttg	ccg	ccg	ttt	gaa	gcc	aat	gga	aaa	atc	ttg	gat	tat	gaa	gtg	act	2064
Leu	Pro	Pro	Phe	Gln	Ala	Asn	Gly	Lys	Ile	Leu	Asp	Tyr	Gln	Val	Thr	
		675					680					685				
ctc	aca	aga	tgg	aaa	tca	cat	tta	caa	aat	tac	aca	gtt	aat	gcc	aca	2112
Leu	Thr	Arg	Trp	Lys	Ser	His	Leu	Gln	Asn	Tyr	Thr	Val	Asn	Ala	Thr	
	690					695					700					
aaa	ctg	aca	gta	aat	ctc	aca	aat	gat	ggc	tat	cta	gca	acc	cta	aca	2160
Lys	Leu	Thr	Val	Asn	Leu	Thr	Asn	Asp	Arg	Tyr	Leu	Ala	Thr	Leu	Thr	
705					710					715					720	
gta	aga	aat	ctt	gtt	ggc	aaa	tca	gat	gca	gct	gtt	tta	acc	atc	ccg	2208
Val	Arg	Asn	Leu	Val	Gly	Lys	Ser	Asp	Ala	Ala	Val	Leu	Thr	Ile	Pro	
			725					730						735		
ggc	tgt	gac	ttt	caa	gct	act	cac	ccg	gta	atg	gat	ctt	aaa	gca	ttc	2256
Ala	Cys	Asp	Phe	Gln	Ala	Thr	His	Pro	Val	Met	Asp	Leu	Lys	Ala	Phe	
		740					745					750				
ccc	aaa	gat	aac	atg	ttt	tgg	gtg	gaa	tgg	act	act	cca	agg	gaa	tct	2304
Pro	Lys	Asp	Asn	Met	Leu	Trp	Val	Gln	Trp	Thr	Thr	Pro	Arg	Gln	Ser	
	755					760						765				
gta	aag	aaa	tat	ata	ctt	gag	tgg	tgt	gtg	tta	tca	gat	aaa	gca	ccc	2352
Val	Lys	Lys	Tyr	Ile	Leu	Gln	Trp	Cys	Val	Leu	Ser	Asp	Lys	Ala	Pro	
	770				775						780					
tgt	atc	aca	gac	tgg	caa	caa	gaa	gat	ggt	acc	gtg	cat	ggc	acc	tat	2400
Cys	Ile	Thr	Asp	Trp	Gln	Gln	Glu	Asp	Gly	Thr	Val	His	Arg	Thr	Tyr	
785					790				795						800	
tta	aga	ggg	aac	tta	gca	gag	agc	aaa	tgc	tat	tgg	ata	aca	gtt	act	2448
Leu	Arg	Gly	Asn	Leu	Ala	Gln	Ser	Lys	Cys	Tyr	Leu	Ile	Thr	Val	Thr	
			805						810					815		
cca	gta	tat	gct	gat	gga	cca	gga	agc	ccg	gaa	ccc	ata	aag	gca	tac	2496
Pro	Val	Tyr	Ala	Asp	Gly	Pro	Gly	Ser	Pro	Glu	Ser	Ile	Lys	Ala	Tyr	
		820					825					830				
ctt	aaa	caa	gct	cca	ccg	tcg	aaa	gga	ccg	act	gtt	egg	aca	aaa	aaa	2544
Leu	Lys	Gln	Ala	Pro	Pro	Ser	Lys	Gly	Pro	Thr	Val	Arg	Thr	Lys	Lys	
	835						840					845				
gta	ggg	aaa	aac	gaa	gct	gtc	tta	gag	tgg	gac	caa	ctt	ccg	gtt	gat	2592
Val	Gly	Lys	Asn	Glu	Ala	Val	Leu	Gln	Trp	Asp	Gln	Leu	Pro	Val	Asp	
	850					855					860					
gtt	cag	aat	gga	ttt	atc	aga	aat	tat	act	ata	ttt	tat	aga	acc	atc	2640
Val	Gln	Asn	Gly	Phe	Ile	Arg	Asn	Tyr	Thr	Ile	Phe	Tyr	Arg	Thr	Ile	
	865				870					875					880	
att	gga	aat	gaa	act	gct	gtg	aat	gtg	gat	ctt	ccc	cac	aca	gaa	tat	2688
Ile	Gly	Asn	Gln	Thr	Ala	Val	Asn	Val	Asp	Ser	Ser	His	Thr	Gln	Tyr	
			885						890					895		
aca	ctg	tcg	act	arg	act	agt	gac	aca	tgg	tac	atg	gta	cca	atg	gaa	2736
Thr	Leu	Ser	Ser	Leu	Thr	Ser	Asp	Thr	Leu	Tyr	Met	Val	Arg	Met	Ala	
		900					905						910			
gca	tac	aca	gat	gaa	ggt	ggg	aag	gat	ggt	cca	gaa	ttc	acc	ttt	act	2784

Ala	Tyr	Thr	Asp	Glu	Gly	Gly	Lys	Asp	Gly	Pro	Glu	Phe	Thr	Phe	Thr	
		915					920					925				
acc	cca	aag	ttt	ggt	caa	gga	gaa	att	gaa	taa	ggg	ggg	gac	aaa	aat	2881
Thr	Pro	Lys	Phe	Ala	Gln	Gly	Glu	Ile	Glu	Ser	Gly	Gly	Asp	Lys	Thr	
	930					935					940					
cac	aca	tgc	cca	cgg	tgc	cca	gca	cca	gaa	ctc	ctg	ggg	gga	ccg	cca	2880
His	Thr	Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Leu	Leu	Gly	Gly	Pro	Ser	
945					950					955					960	
gtc	ttc	ctc	ttc	ccc	cca	aaa	ccc	aag	gac	acc	ctc	atg	acc	ccc	ggg	2928
Val	Phe	Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg	
				965					970					975		
acc	ccg	gag	gtc	aca	tgc	gtg	gtg	gtg	gac	gtg	agg	cac	gaa	gac	ccg	2976
Thr	Pro	Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val	Ser	His	Glu	Asp	Pro	
			980					985					990			
gag	gtc	aag	ttc	aac	tgg	tac	gtg	gac	ggc	gtg	gag	gtg	cat	aat	goc	3024
Glu	Val	Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala	
		995					1000					1005				
aag	aca	aag	cgg	cgg	gag	gag	cag	tac	aac	agg	acg	tac	cgt	gtg	gtc	3072
Lys	Thr	Lys	Pro	Arg	Glu	Glu	Gln	Tyr	Asn	Ser	Thr	Tyr	Arg	Val	Val	
	1010					1015					1020					
agg	gtc	ctc	acc	gtc	ctg	cat	cag	gac	tgg	ctg	aat	ggg	aag	gag	tac	3120
Ser	Val	Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	
1025					1030					1035					1040	
aag	tgc	aag	gtc	taa	aac	aaa	goc	ctc	cca	goc	ccc	atc	gag	aaa	acc	3168
Lys	Cys	Lys	Val	Ser	Asn	Lys	Ala	Leu	Pro	Ala	Pro	Ile	Glu	Lys	Thr	
				1045					1050					1055		
atc	ttc	aaa	gtc	aaa	ggg	cag	ccc	cga	gaa	cca	cag	gtg	tac	acc	ctg	3216
Ile	Ser	Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr	Leu	
			1060					1065					1070			
ccc	cca	ttc	cgg	gat	gag	ctg	acc	aag	aac	cag	gtc	agg	ctg	acc	tgc	3264
Pro	Pro	Ser	Arg	Asp	Glu	Leu	Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys	
		1075					1080					1085				
ctg	gtc	aaa	ggg	ttc	tat	ccc	agg	gac	atc	goc	gtg	gag	tgg	gag	agg	3312
Leu	Val	Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser	
	1090					1095					1100					
aat	ggg	cag	cgg	gag	aac	aac	tac	aag	acc	agg	ccc	ccc	gtg	ctg	gac	3360
Asn	Gly	Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro	Pro	Val	Leu	Asp	
	1105				1110					1115					1120	
ccc	gac	ggc	ttc	ttc	ctc	tac	agg	aag	ctc	acc	gtg	gac	aag	agg		3408
Ser	Asp	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Lys	Leu	Thr	Val	Asp	Lys	Ser	
				1125					1130				1135			
agg	tgg	cag	cag	ggg	aac	gtc	ttc	cca	tgc	ttc	gtg	atg	cat	gag	goc	3456
Arg	Trp	Gln	Gln	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala	
			1140					1145					1150			
ctg	cac	aac	ccc	tac	cag	cag	aag	agg	ctc	ttc	ctg	ttc	ccg	ggg	aaa	3504
Leu	His	Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu	Ser	Pro	Gly	Lys	

1155

1161

1165

tga

3507

&lt;010&gt; 24

&lt;011&gt; 1168

&lt;012&gt; PRT

&lt;013&gt; Homo sapiens

&lt;400&gt; 24

Met	Val	Ala	Val	Gly	Cys	Ala	Leu	Leu	Ala	Ala	Leu	Leu	Ala	Ala	Pro
1				5					10					15	
Gly	Ala	Ala	Leu	Ala	Pro	Arg	Arg	Cys	Pro	Ala	Gln	Glu	Val	Ala	Arg
			20					25					30		
Gly	Val	Leu	Thr	Ser	Leu	Pro	Gly	Asp	Ser	Val	Thr	Leu	Thr	Cys	Pro
		35					40					45			
Gly	Val	Glu	Pro	Glu	Asp	Asn	Ala	Thr	Val	His	Irp	Val	Leu	Arg	Lys
	50					55					60				
Pro	Ala	Ala	Gly	Ser	His	Pro	Ser	Arg	Trp	Ala	Gly	Met	Gly	Arg	Arg
65					70					75					80
Leu	Leu	Leu	Arg	Ser	Val	Gln	Leu	His	Asp	Ser	Gly	Asn	Tyr	Ser	Cys
			85						90					95	
Tyr	Arg	Ala	Gly	Arg	Pro	Ala	Gly	Thr	Val	His	Leu	Leu	Val	Asp	Val
		100					105						110		
Pro	Pro	Glu	Pro	Gln	Leu	Ser	Cys	Phe	Arg	Lys	Ser	Pro	Leu	Ser	
		115				120					125				
Asn	Val	Val	Cys	Glu	Trp	Gly	Pro	Arg	Ser	Thr	Pro	Ser	Leu	Thr	Thr
	130					135					140				
Lys	Ala	Val	Leu	Leu	Val	Arg	Lys	Phe	Gln	Asn	Ser	Pro	Ala	Glu	Asp
145					150					155					160
Phe	Gln	Glu	Pro	Cys	Gln	Tyr	Ser	Gln	Glu	Ser	Gln	Lys	Phe	Ser	Cys
			165						170					175	
Gln	Leu	Ala	Val	Pro	Glu	Gly	Asp	Ser	Ser	Phe	Tyr	Ile	Val	Ser	Met
		180					185						190		
Cys	Val	Ala	Ser	Ser	Val	Gly	Ser	Lys	Phe	Ser	Lys	Thr	Gln	Thr	Phe
		195				200						205			
Gln	Gly	Cys	Gly	Ile	Leu	Gln	Pro	Asp	Pro	Pro	Ala	Asn	Ile	Thr	Val
	210					215					220				
Thr	Ala	Val	Ala	Arg	Asn	Pro	Arg	Trp	Leu	Ser	Val	Thr	Trp	Gln	Asp
225					230					235					240
Pro	His	Ser	Trp	Asn	Ser	Ser	Phe	Tyr	Arg	Leu	Arg	Phe	Glu	Leu	Arg
			245						250					255	
Tyr	Arg	Ala	Glu	Arg	Ser	Lys	Thr	Phe	Thr	Thr	Trp	Met	Val	Lys	Asp
		260						265					270		
Leu	Gln	His	His	Cys	Val	Ile	His	Asp	Ala	Trp	Ser	Gly	Leu	Arg	His
		275					280					285			
Val	Val	Gln	Leu	Arg	Ala	Gln	Glu	Glu	Phe	Gly	Gln	Gly	Glu	Trp	Ser
	290					295					300				
Glu	Trp	Ser	Pro	Glu	Ala	Met	Gly	Thr	Pro	Trp	Thr	Glu	Ser	Arg	Ser
305					310					315					320
Pro	Pro	Ala	Glu	Asn	Glu	Val	Ser	Thr	Pro	Met	Thr	Gly	Gly	Ala	Pro
			325						330					335	
Ser	Gly	Ala	Gln	Leu	Glu	Leu	Leu	Asp	Pro	Cys	Gly	Tyr	Ile	Ser	Pro
		340					345						350		
Glu	Ser	Pro	Val	Val	Gln	Leu	His	Ser	Asn	Phe	Thr	Ala	Val	Cys	Val
		355				360						365			
Leu	Lys	Glu	Lys	Cys	Met	Asp	Tyr	Phe	His	Val	Asn	Ala	Asn	Tyr	Ile
	370					375					380				
Val	Trp	Lys	Thr	Asn	His	Phe	Thr	Ile	Pro	Lys	Glu	Gln	Tyr	Thr	Ile
385					390					395					400
Ile	Asn	Arg	Thr	Ala	Ser	Ser	Val	Thr	Phe	Thr	Asp	Ile	Ala	Ser	Leu

				405				410					415				
Asn	Ile	Gln	Leu	Thr	Cys	Asn	Ile	Leu	Thr	Phe	Gly	Gln	Leu	Glu	Gln		
			400					405					410				
Asn	Val	Tyr	Gly	Ile	Thr	Ile	Ile	Ser	Gly	Leu	Pro	Pro	Gln	Lys	Pro		
		435					440					445					
Lys	Asn	Leu	Ser	Cys	Ile	Val	Asn	Glu	Gly	Lys	Lys	Met	Arg	Cys	Glu		
	450					455				460							
Trp	Asp	Gly	Gly	Arg	Glu	Thr	His	Leu	Glu	Thr	Asn	Phe	Thr	Leu	Lys		
465				470					475						480		
Ser	Glu	Trp	Ala	Thr	His	Lys	Phe	Ala	Asp	Cys	Lys	Ala	Lys	Arg	Asp		
			485					490						495			
Thr	Pro	Thr	Ser	Cys	Thr	Val	Asp	Tyr	Ser	Thr	Val	Tyr	Phe	Val	Asn		
			500				505						510				
Ile	Glu	Val	Trp	Val	Glu	Ala	Glu	Asn	Ala	Leu	Gly	Lys	Val	Thr	Ser		
	515					520						525					
Asp	His	Ile	Asn	Phe	Asp	Pro	Val	Tyr	Lys	Val	Lys	Pro	Asn	Pro	Pro		
	530					535					540						
His	Asn	Leu	Ser	Val	Ile	Asn	Ser	Glu	Glu	Leu	Ser	Ser	Ile	Leu	Lys		
545				550						555					560		
Leu	Thr	Trp	Thr	Asn	Pro	Ser	Ile	Lys	Ser	Val	Ile	Ile	Leu	Lys	Tyr		
			565					570						575			
Asn	Ile	Gln	Tyr	Arg	Thr	Lys	Asp	Ala	Ser	Thr	Trp	Ser	Gln	Ile	Pro		
		580					585						590				
Pro	Glu	Asp	Thr	Ala	Ser	Thr	Arg	Ser	Ser	Phe	Thr	Val	Gln	Asp	Leu		
	595					600						605					
Lys	Pro	Phe	Thr	Glu	Tyr	Val	Phe	Arg	Ile	Arg	Cys	Met	Lys	Glu	Asp		
	610					615						620					
Gly	Lys	Gly	Tyr	Trp	Ser	Asp	Trp	Ser	Glu	Glu	Ala	Ser	Gly	Ile	Thr		
625				630					635						640		
Tyr	Glu	Asp	Arg	Pro	Ser	Lys	Ala	Pro	Ser	Phe	Trp	Tyr	Lys	Ile	Asp		
			645					650						655			
Pro	Ser	His	Thr	Gln	Gly	Tyr	Arg	Thr	Val	Gln	Leu	Val	Trp	Lys	Thr		
		660					665						670				
Leu	Pro	Pro	Phe	Glu	Ala	Asn	Gly	Lys	Ile	Leu	Asp	Tyr	Glu	Val	Thr		
	675						680					685					
Leu	Thr	Arg	Trp	Lys	Ser	His	Leu	Gln	Asn	Tyr	Thr	Val	Asn	Ala	Thr		
	690					695					700						
Lys	Leu	Thr	Val	Asn	Leu	Thr	Asn	Asp	Arg	Tyr	Leu	Ala	Thr	Leu	Thr		
705				710						715					720		
Val	Arg	Asn	Leu	Val	Gly	Lys	Ser	Asp	Ala	Ala	Val	Leu	Thr	Ile	Pro		
			725					730						735			
Ala	Lys	Asp	Phe	Gln	Ala	Thr	His	Pro	Val	Met	Asp	Leu	Lys	Ala	Phe		
		740					745					750					
Pro	Lys	Asp	Asn	Met	Leu	Trp	Val	Glu	Trp	Thr	Thr	Pro	Arg	Glu	Ser		
	755					760						765					
Val	Lys	Lys	Tyr	Ile	Leu	Glu	Trp	Cys	Val	Leu	Ser	Asp	Lys	Ala	Pro		
	770					775						780					
Cys	Ile	Thr	Asp	Trp	Gln	Gln	Glu	Asp	Gly	Thr	Val	His	Arg	Thr	Tyr		
785				790					795						800		
Leu	Arg	Gly	Asn	Leu	Ala	Glu	Ser	Lys	Cys	Tyr	Leu	Ile	Thr	Val	Thr		
			805					810						815			
Pro	Val	Tyr	Ala	Asp	Gly	Pro	Gly	Ser	Pro	Glu	Ser	Ile	Lys	Ala	Tyr		
		820					825						830				
Leu	Lys	Gln	Ala	Pro	Pro	Ser	Lys	Gly	Pro	Thr	Val	Arg	Thr	Lys	Lys		
	835						840					845					
Val	Gly	Lys	Asn	Glu	Ala	Val	Leu	Glu	Trp	Asp	Gln	Leu	Pro	Val	Asp		
	850					855					860						
Val	Gln	Asn	Gly	Phe	Ile	Arg	Asn	Tyr	Thr	Ile	Phe	Tyr	Arg	Thr	Ile		
865				870					875						880		
Ile	Gly	Asn	Glu	Thr	Ala	Val	Asn	Val	Asp	Ser	Ser	His	Thr	Glu	Tyr		
			885					890						895			



Thr	Leu	Ser	Ser	Leu	Thr	Ser	Asp	Thr	Leu	Tyr	Met	Val	Arg	Met	Ala	
		900					905						910			
Ala	Tyr	Thr	Asp	Glu	Gly	Gly	Lys	Asp	Gly	Pro	Glu	Phe	Thr	Phe	Thr	
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Leu	Val	Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser	
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Arg	Trp	Gln	Gln	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala	
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Gly	Ala	Ala	Leu	Ala	Pro	Arg	Arg	Cys	Pro	Ala	Gln	Glu	Val	Ala	Arg	
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Gly	Val	Leu	Thr	Ser	Leu	Pro	Gly	Asp	Ser	Val	Thr	Leu	Thr	Cys	Pro	
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Gly	Val	Glu	Pro	Glu	Asp	Asn	Ala	Thr	Val	His	Tyr	Val	Leu	Arg	Lys	
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Pro	Ala	Ala	Gly	Ser	His	Pro	Ser	Arg	Trp	Ala	Gly	Met	Gly	Arg	Arg	
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Leu	Leu	Leu	Arg	Ser	Val	Gln	Leu	His	Asp	Ser	Gly	Asn	Tyr	Ser	Cys	
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tac	ggg	goc	ggc	ggc	cca	gct	ggg	act	gtg	cac	tgg	ctg	atg	gat	ggt	336
Tyr	Arg	Ala	Gly	Arg	Pro	Ala	Gly	Thr	Val	His	Leu	Leu	Val	Asp	Val	
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Pro	Pro	Glu	Glu	Pro	Gln	Leu	Ser	Cys	Phe	Arg	Lys	Ser	Pro	Leu	Ser	
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Lys	Ala	Val	Leu	Leu	Val	Arg	Lys	Phe	Gln	Asn	Ser	Pro	Ala	Glu	Asp	
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Phe	Gln	Glu	Pro	Cys	Gln	Tyr	Ser	Gln	Glu	Ser	Gln	Lys	Phe	Ser	Cys	
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Gln	Leu	Ala	Val	Pro	Glu	Gly	Asp	Ser	Ser	Phe	Tyr	Ile	Val	Ser	Met	
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Cys	Val	Ala	Ser	Ser	Val	Gly	Ser	Lys	Phe	Ser	Lys	Thr	Gln	Thr	Phe	
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Thr	Ala	Val	Ala	Arg	Asn	Pro	Arg	Trp	Leu	Ser	Val	Thr	Trp	Gln	Asp	
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ccc	cac	tcg	tgg	aac	tca	tcg	ttc	tac	aga	cta	egg	ttc	gag	ctc	aga	768
Pro	His	Ser	Trp	Asn	Ser	Ser	Phe	Tyr	Arg	Leu	Arg	Phe	Glu	Leu	Arg	
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Tyr	Arg	Ala	Glu	Arg	Ser	Lys	Thr	Phe	Thr	Thr	Trp	Met	Val	Lys	Asp	
			260					265					270			
ctc	cag	cac	cac	tgt	gtc	atc	cac	gac	goc	tgg	agg	ggc	ctg	agg	cac	864
Leu	Gln	His	His	Cys	Val	Ile	His	Asp	Ala	Trp	Ser	Gly	Leu	Arg	His	
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ggg	gtg	cag	ctt	cgt	goc	cag	gag	gag	ttc	ggg	caa	ggc	gag	gag	agg	912
Val	Val	Gln	Leu	Arg	Ala	Gln	Glu	Glu	Phe	Gly	Gln	Gly	Gln	Trp	Ser	
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tgt Cys	ggc Gly	cac Tyr	acc Ile 340	agt Ser	ccc Pro	gaa Glu	ccc Ser	cca Pro 345	gtt Val	gta Val	caa Gln	ccc Leu	cac His 350	ccc Ser	aat Asn	1066
ttc Phe	act Thr	gca Ala 355	gtt Val	tgt Cys	gtg Val	cta Leu	aag Lys 360	gaa Glu	aaa Lys	tgt Cys	atg Met	gac Asp 365	cac Tyr	ccc Phe	cat His	1104
gta Val	aat Asn 370	gct Ala	aat Asn	tac Tyr	att Ile	gtc Val 375	tgg Trp	aaa Lys	aca Thr	aac Asn	cat His 380	ttt Phe	act Thr	att Ile	ccc Pro	1162
aag Lys 385	gag Glu	caa Gln	cac Tyr	act Thr	acc Ile	ata Ile	aac Asn	aga Arg	aca Thr	gca Ala 395	ccc Ser	agt Ser	gtc Val	acc Thr	ttt Phe 400	1200
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ctt Leu	ggg Gly	aag Lys	gtt Val	aca Thr	cca Ser	gat Asp	cat His	acc Ile	aac Asn	ttt Phe	gac Asp	ccc Pro	gta Val	tat Tyr	aaa Lys	1584
gtg Val	aag Lys	ccc Pro	aat Asn	ccg Pro	cca Pro	cat His	aat Asn	cca Leu	cca Ser	gtg Val	atc Ile	aac Asn	cca Ser	gag Glu	gaa Glu	1632
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Val	Ile	Ile	Leu	Lys	Tyr	Asn	Ile	Gln	Tyr	Arg	Thr	Lys	Asp	Ala	Ser	
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Thr	Trp	Ser	Gln	Ile	Pro	Pro	Glu	Asp	Thr	Ala	Ser	Thr	Arg	Ser	Ser	
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Phe	Thr	Val	Gln	Asp	Leu	Lys	Pro	Phe	Thr	Glu	Tyr	Val	Phe	Arg	Ile	
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Arg	Cys	Met	Lys	Glu	Asp	Gly	Lys	Gly	Tyr	Trp	Ser	Asp	Trp	Ser	Glu	
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Glu	Ala	Ser	Gly	Ile	Thr	Tyr	Glu	Asp	Arg	Pro	Ser	Lys	Ala	Pro	Ser	
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Phe	Trp	Tyr	Lys	Ile	Asp	Pro	Ser	His	Thr	Gln	Gly	Tyr	Arg	Thr	Val	
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caa	ctc	gtg	tgg	aag	aca	tgg	ccc	ccc	ttt	gaa	gcc	aat	gga	aaa	atc	2016
Gln	Leu	Val	Trp	Lys	Thr	Leu	Pro	Pro	Phe	Glu	Ala	Asn	Gly	Lys	Ile	
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Leu	Asp	Tyr	Glu	Val	Thr	Leu	Thr	Arg	Trp	Lys	Ser	His	Leu	Gln	Asn	
			675				680					685				
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Tyr	Thr	Val	Asn	Ala	Thr	Lys	Leu	Thr	Val	Asn	Leu	Thr	Asn	Asp	Arg	
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tat	cta	gca	acc	cta	aca	gta	aga	aat	ctt	gtt	ggc	aaa	tca	gat	gca	2160
Tyr	Leu	Ala	Thr	Leu	Thr	Val	Arg	Asn	Leu	Val	Gly	Lys	Ser	Asp	Ala	
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Ala	Val	Leu	Thr	Ile	Pro	Ala	Cys	Asp	Phe	Gln	Ala	Thr	His	Pro	Val	
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Met	Asp	Leu	Lys	Ala	Phe	Pro	Lys	Asp	Asn	Met	Leu	Trp	Val	Gln	Trp	
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Thr	Thr	Pro	Arg	Gln	Ser	Val	Lys	Lys	Tyr	Ile	Ile	Gln	Trp	Cys	Val	
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Leu	Ser	Asp	Lys	Ala	Pro	Cys	Ile	Thr	Asp	Trp	Gln	Gln	Glu	Asp	Gly	
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Tyr	Leu	Ile	Thr	Val	Thr	Pro	Val	Tyr	Ala	Asp	Gly	Pro	Gly	Ser	Pro	
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Glu	Ser	Ile	Lys	Ala	Tyr	Leu	Lys	Gln	Ala	Pro	Pro	Ser	Lys	Gly	Pro	
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Thr	Val	Arg	Thr	Lys	Lys	Val	Gly	Lys	Asn	Glu	Ala	Val	Leu	Glu	Trp	
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Ser	Ser	His	Thr	Glu	Tyr	Thr	Leu	Ser	Ser	Leu	Thr	Ser	Asp	Thr	Leu	
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Tyr	Met	Val	Arg	Met	Ala	Ala	Tyr	Thr	Asp	Glu	Gly	Gly	Lys	Asp	Gly	
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Pro	Glu	Phe	Thr	Phe	Thr	Thr	Pro	Lys	Phe	Ala	Gln	Gly	Glu	Ile	Glu	
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Leu	Leu	Gly	Gly	Pro	Ser	Val	Phe	Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	
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Thr	Leu	Met	Ile	Ser	Arg	Thr	Pro	Glu	Val	Thr	Cys	Val	Val	Val	Asp	
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Val	Ser	His	Glu	Asp	Pro	Glu	Val	Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly	
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Val	Glu	Val	His	Asn	Ala	Lys	Thr	Lys	Pro	Arg	Glu	Glu	Gln	Tyr	Asn	
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 Tyr Arg Ala Gly Arg Pro Ala Gly Thr Val His Leu Leu Val Asp Val  
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Pro	His	Ser	Trp	Asn	Ser	Ser	Phe	Tyr	Arg	Leu	Arg	Phe	Glu	Leu	Arg	
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Tyr	Thr	Val	675	Asn	Ala	Thr	Lys	Leu	680	Thr	Val	Asn	Leu	Thr	685	Asn	Asp	Arg
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Ala	Val	Leu	725	Thr	Ile	Pro	Ala	Cys	730	Asp	Phe	Gln	Ala	Thr	His	Pro	Val	
Met	Asp	Leu	740	Lys	Ala	Phe	Pro	Lys	745	Asp	Asn	Met	Leu	Trp	Val	Glu	Trp	
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Gln Ser Asp Ala Ser Glu Arg Cys Asp Asp Trp Gly Leu Asp Thr Met  
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Arg Gln Ile Gln Val Phe Glu Asp Glu Pro Ala Arg Ile Lys Cys Pro  
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Leu Phe Glu His Phe Leu Lys Phe Asn Tyr Ser Thr Ala His Ser Ala  
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Gly Leu Thr Leu Ile Trp Tyr Trp Thr Arg Gln Asp Arg Asp Leu Glu  
65 70 75 80  
gag cca att aac ttc cgc ctc ccc gag aac cgc att agt aag gag aaa 288  
Glu Pro Ile Asn Phe Arg Leu Pro Glu Asn Arg Ile Ser Lys Glu Lys  
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Asp Val Leu Trp Phe Arg Pro Thr Leu Leu Asn Asp Thr Gly Asn Tyr  
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acc tgc atg tta agg aac act aca tat tgc agc aaa gtt gca ttt ccc 384  
Thr Cys Met Leu Arg Asn Thr Thr Tyr Cys Ser Lys Val Ala Phe Pro  
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Pro Val His Lys Leu Tyr Ile Glu Tyr Gly Ile Gln Arg Ile Thr Cys  
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Pro Asn Val Asp Gly Tyr Phe Pro Ser Ser Val Lys Pro Thr Ile Thr  
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cct gct aag gtg gag gat tca gga cat tac tat tgc gtg gta aga aat 1344	1344

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Ser	Ser	Tyr	Cys	Leu	Arg	Ile	Lys	Ile	Ser	Ala	Lys	Phe	Val	Glu	Asn	
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gag	ccc	aac	tta	tgt	tat	aat	gca	caa	gcc	ata	ccc	aaq	cag	aaa	cta	1440
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His	Ala	Ser	Tyr	Thr	Tyr	Leu	Gly	Lys	Gln	Tyr	Pro	Ile	Thr	Arg	Val	
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Gln	Leu	Ile	Cys	Asn	Val	Thr	Gly	Gln	Leu	Ser	Asp	Ile	Ala	Tyr	Trp	
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Lys	Trp	Asn	Gly	Ser	Val	Ile	Asp	Glu	Asp	Asp	Pro	Val	Leu	Gly	Glu	
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 Ser Arg Thr Glu Asp Glu Thr Arg Thr Gln Ile Leu Ser Ile Lys Lys  
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 Gly Thr Ile Thr Trp Tyr Lys Asp Asp Ser Lys Thr Pro Val Ser Thr  
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 Glu Gln Ala Ser Arg Ile His Gln His Lys Glu Lys Leu Trp Phe Val  
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 Pro Ala Lys Val Glu Asp Ser Gly His Tyr Tyr Cys Val Val Arg Asn  
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Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala	Lys	Thr	
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Leu	Leu	Gln	Val	Ala	Ser	Ser	Gly	Asn	Met	Lys	Val	Leu	Gln	Glu	Pro		
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acc	tgc	gtc	tcg	gac	tac	atg	agg	atc	tcg	acc	tgc	gag	tgg	aag	atg		144
Thr	Cys	Val	Ser	Asp	Tyr	Met	Ser	Ile	Ser	Thr	Cys	Glu	Trp	Lys	Met		
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Asn	Gly	Pro	Thr	Asn	Cys	Ser	Thr	Glu	Leu	Arg	Leu	Leu	Tyr	Gln	Leu		
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Gly	Ala	Gly	Cys	Val	Cys	His	Leu	Leu	Met	Asp	Asp	Val	Val	Ser	Ala		
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gat	aac	tat	aca	ctg	gac	ctg	tgg	gtc	ggg	cag	cag	ctg	ctg	tgg	aag		336
Asp	Asn	Tyr	Thr	Leu	Asp	Leu	Trp	Ala	Gly	Gln	Gln	Leu	Leu	Trp	Lys		
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Gly	Ser	Phe	Lys	Pro	Ser	Glu	His	Val	Lys	Pro	Arg	Ala	Pro	Gly	Asn		
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Asn	Pro	Tyr	Pro	Pro	Asp	Asn	Tyr	Leu	Tyr	Asn	His	Leu	Thr	Tyr	Ala		
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Val	Asn	Ile	Trp	Ser	Glu	Asn	Asp	Pro	Ala	Asp	Phe	Arg	Ile	Tyr	Asn		
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Val	Thr	Tyr	Leu	Glu	Pro	Ser	Leu	Arg	Ile	Ala	Ala	Ser	Thr	Leu	Lys		
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tcg	ggg	att	tcg	tac	agg	gca	ggc	gtg	agg	gca	tgg	gct	cag	agg	tat		624
Ser	Gly	Ile	Ser	Tyr	Arg	Ala	Arg	Val	Arg	Ala	Trp	Ala	Gln	Ser	Tyr		
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Thr	Glu	Thr	Gln	Pro	Pro	Val	Thr	Asn	Leu	Ser	Val	Ser	Val	Glu	Asn	245
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Asn	Cys	Ser	Leu	Trp	Tyr	Phe	Ser	His	Phe	Gly	Asp	Lys	Gln	Asp	Lys	275
aaa	ata	gct	ccg	gaa	act	tgt	tgt	ttt	ata	gaa	gta	ccc	ctg	aat	gag	912
Lys	Ile	Ala	Pro	Glu	Thr	Arg	Arg	Ser	Ile	Glu	Val	Pro	Leu	Asn	Glu	290
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ccc	gag	tot	gct	gtg	act	gag	ccc	caa	tgc	att	tgg	caa	aaa	ctg	agg	1056
Pro	Glu	Ser	Ala	Val	Thr	Glu	Leu	Gln	Cys	Ile	Trp	His	Asn	Leu	Ser	340
tac	atg	aag	tgt	tot	tgg	ctc	ccc	gga	agg	aat	acc	agt	ccc	gac	act	1104
Tyr	Met	Lys	Cys	Ser	Trp	Leu	Pro	Gly	Arg	Asn	Thr	Ser	Pro	Asp	Thr	355
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Asn	Tyr	Thr	Leu	Tyr	Tyr	Trp	His	Arg	Ser	Leu	Glu	Lys	Ile	His	Gln	370
tgt	gaa	aac	atc	ttt	aga	gaa	ggc	caa	tac	ttt	ggc	tgt	ccc	ttt	gat	1200
Cys	Glu	Asn	Ile	Phe	Arg	Glu	Gly	Gln	Tyr	Phe	Gly	Cys	Ser	Phe	Asp	385
ctg	acc	aaa	gtg	aag	gat	ccc	agt	ttt	gaa	caa	caa	agt	gtc	caa	ata	1248
Leu	Thr	Lys	Val	Lys	Asp	Ser	Ser	Phe	Glu	Gln	His	Ser	Val	Gln	Ile	405
atg	gtc	aag	gat	aat	gca	gga	aaa	att	aaa	cca	ccc	ttc	aat	ata	gtg	1296
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ccc	tta	act	ccc	agt	gtg	aaa	ccc	gat	ccc	cca	cat	att	aaa	aac	ctc	1344
Pro	Leu	Thr	Ser	Arg	Val	Lys	Pro	Asp	Pro	Pro	His	Ile	Lys	Asn	Leu	435
ccc	ttc	cac	aat	gat	gac	cta	tat	gtg	caa	tgg	gag	aat	cca	cag	aat	1392
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caa gaa ttt gag aga aat gtc gag aat aca tct tgt ttc atg gtc cct Pro Glu Phe Glu Arg Asn Val Glu Asn Thr Ser Cys Phe Met Val Pro 500 505 510			1536
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acc cct gag gtc aca tgc gtg gtg gtg gac gtg agc cac gaa gac cct Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro 595 600 605			1824
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Arg	Trp	Gln	Gln	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala	
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FIRST CLASS MAIL CERTIFICATE

I hereby certify that this document is being deposited with the United States Postal Service on this date as first class mail addressed to: U.S. Patent and Trademark Office, Box Sequence, P.O. Box 2327, Arlington, VA 22202.

Bernadette B. Fahey  
Bernadette B. Fahey

July 30, 2002  
Date

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Application Of : Neil Stahl, et al.  
USSN : 09/787,835  
Int'l File No.: : PCT/US99/22045  
Int'l File Date: : September 22, 1999  
For : RECEPTOR BASED ANTAGONISTS, AND  
METHODS OF MAKING AND USING  
Examiner : Unknown  
Group : Unknown

July 30, 2002

Commissioner for Patents  
U.S. Patent and Trademark Office  
Box Sequence, P.O. Box 2327  
Arlington, VA 22202

**Transmittal of Sequence Listing**

Sir:

In response to the May 30, 2002 Notification of Missing Requirements Under 35 U.S.C. 371 In The United States Designated/Elected Office (DO/EO/US) ("Notification"), Applicants enclose herewith as Exhibit 1: copy of the May 30, 2002, Notification, Exhibit 2: Sequence Listings in paper and computer-readable forms, Exhibit 3: copy of concurrently filed Amendment and Response to May 30, 2002, Notification (without exhibits) for the above-referenced patent application. A

response to the May 30, 2002 Office Communication is due on July 30, 2002, and, therefore, this response is being timely filed.

Applicants direct the subject Sequence Listings submitted herewith be added to the specification.

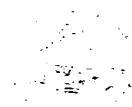
I hereby state that the content of the paper and computer readable copies of the Sequence Listing, submitted in accordance with 37 C.F.R §1.821(c) and (e) respectively, are the same. I hereby state that the content of the paper and computer readable copies of the Sequence Listing submitted herewith and referred to herein in accordance with 37 C.F.R. § 1.821(g), contain no new matter.

No fee is deemed necessary for filing this paper. However, if any fees are deemed necessary, the Commissioner is hereby authorized to charge any such fees required by this paper to Deposit Account No. 18-0650.

Respectfully submitted,

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UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	Case No.	Class
07/571,835	Neil Stahl	REG 2036-718

Office of the Commissioner of Patents
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PCT/US-01/22,45

Examination Unit	Examination Unit
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03/22/2001

03/25/2001

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CONFIRMATION NO. 8053

371 FORMALITIES LETTER



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Date Mailed: 11/08/2002

### NOTIFICATION OF DEFECTIVE RESPONSE

The following items have been submitted by the applicant or the IB to the United States Patent and Trademark Office as an Elected Office (37 CFR 1.495):

- U.S. Basic National Fee
- Priority Document
- Copy of IPE Report
- Copy of references cited in ISR
- Copy of the International Application
- Copy of the International Search Report
- Information Disclosure Statements
- Oath or Declaration
- Preliminary Amendments
- Request for Immediate Examination

Applicant's response filed 03/22/2001 is hereby acknowledged. The following requirements set forth in the NOTIFICATION of MISSING REQUIREMENTS mailed 05/30/2002 have not been completed.

The following items **MUST** be furnished within the period set forth below in order to complete the requirements for acceptance under 35 U.S.C. 371:

**Applicant is required to complete the response within a time limit of ONE MONTH from the date of this Notification or within the time remaining in the response set forth in the Notification of Missing Requirements, whichever is the longer. No extension of this time limit may be granted under 37 CFR 1.136, but the period for response set in the Notification of Missing Requirements may be extended under 37 CFR 1.136(a).**

The following items **MUST** be furnished within the period set forth below:

- The nucleotide and/or amino acid sequence disclosure contained in this application does not comply with the requirements for such a disclosure as set forth in 37 CFR 1.821-1.825 for the following reasons:

- This application does not contain a "Sequence Listing" as a separate part of the disclosure on paper copy or compact disc, as required by 37 CFR 1.821(c).
  - A copy of the "Sequence Listing" in computer readable form has not been submitted as required by 37 CFR 1.821(e).
  - APPLICANT MUST PROVIDE:
    - An initial or substitute computer readable form (CRF) of the "Sequence Listing."
    - An initial or substitute paper copy or compact disc of the "Sequence Listing," as well as an amendment directing its entry into the specification.
- For questions regarding compliance to 37 CFR 1.821-1.825 requirements, please contact:
- For Rules Interpretation, call (703) 308-4216
  - To Purchase PatentIn Software, call (703) 306-2600
  - For PatentIn Software Program Help, call (703) 306-4119 or e-mail at [patin21help@uspto.gov](mailto:patin21help@uspto.gov) or [patin3help@uspto.gov](mailto:patin3help@uspto.gov)
- This application does not contain a "Sequence Listing" as a separate part of the disclosure on paper copy or compact disc, as required by 37 CFR 1.821(c).
  - A copy of the "Sequence Listing" in computer readable form has not been submitted as required by 37 CFR 1.821(e).

Applicant is reminded that any communications to the United States Patent and Trademark Office must be mailed to the address given in the heading and include the U.S. application no. shown above (37 CFR 1.5)

*A copy of this notice **MUST** be returned with the response.*

SHAKEL AHMED

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PART 1 - ATTORNEY/APPLICANT COPY

U.S. APPLICATION NO. 00/000000	INTERNATIONAL APPLICATION NO. PCT/US99/22045	CLASS. CODE REG. 2.000000
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